*afila*: The Whole Story, From Identifying Potential Candidate Genes to Detecting the Responsible Megabase-Scale Deletion

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The *afila* (*af*) mutation in *Pisum sativum* L. (pea) induces the conversion of leaflet primordia into midrib-like primordia, resulting in bipinnate leaves. The phenotype was first reported in 1953 and has since become a highly desirable trait to improve lodging resistance and facilitate mechanical harvesting. Despite its widespread introgression into pea cultivars, the molecular basis of *af* has remained unknown. We have shown that deletion of the *Medicago truncatula PALMATE-LIKE PENTAFOLIATA1* co-orthologs, namely *PsPALM1a* and *PsPALM1b*, is responsible for the af phenotype. Different origins for *af* in released cultivars have been identified and up to seven haplotypes, determined by the size of deletions including *PsPALM1a-b*, have been detected in leafless and semi-leafless pea accessions. This previously unrecognised diversity sheds light on important chapters of pea breeding history and highlights unexplored potential for current and future programmes.

***Reference:***

[1] Tayeh N. et al., afila, the origin and nature of a major innovation in the history of pea breeding, New Phytol., in press, 2024. doi: 10.1111/nph.19800